



University of Bahrain

CE -- CIT -- UOB

**TEST 1 (6 April 2016) ITCE 444:  $\mu$ P-Based Design**

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Time: 60 minutes

**Q1.** [25 marks]

After running the following instructions what will be the contents of WREG, R1 and status flags?

```
R1    EQU    0x10
      MOVLW  0x7F
      MOVWF  R1
      INCF   R1, F
      INCF   R1, W
      INCF   R1, W
      INCF   R1, W
H:    BRA    H
```

**Q2.** [25 marks]

Assemble the following program:

```
ORG 0x005678
BACK: MOVFF PORTE,PORTA
      LFSR  2,345 0x345
      BNZ   BACK
      GOTO  BACK
HERE: BRA   HERE
```

**Q3.** [ 50 marks]

A 6-bit unsigned number (  $X$  ) is presented by 6 switches connected to port B.

A 7-bit unsigned number (  $Y$  ) is presented by 7 switches connected to port C.

Write a program to read these two numbers and calculate  $Z = 2(X^2 + Y^2)$  and save  $Z$  in 0x300.